32-channel High Voltage Power Supply EHQ 20 025p_204

Operators Manual

Contents

Attention!

-The device must not be operated with the cover removed.

-We decline all responsibility for damages and injuries caused by an improper use of the module. It is highly recommended to read the manual before any kind of operation.

Note

The information in this manual is subject to change without notice. We take no responsibility for any error in the document. We reserve the right to make changes in the product design without reservation and without notification to the users.

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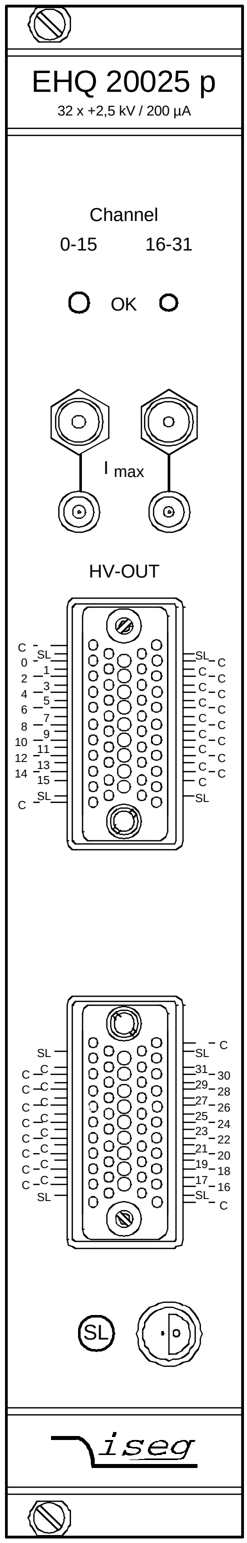
iseg Spezialelektronik GmbH
c/o ROTECH
Bautzner Landstr. 45
D - 01454 Rossendorf
Email: sales@iseg-hv.de
http://www.iseg-hv.com
Germany
Phone ++ 49 351 / 26 95 - 260
Fax ++ 49 351 / 26 95 - 261

1. General information

The EHQ 20 025 is a 32-channel high voltage power supply in 6U Eurocard format. Each single channel is independently controllable. The EHQ 20 025 is made ready for mounting into a crate. The powered system crate ECH xxx (19“ rack) carries up to 8 modules. It is also possible to supply the modules separately with the necessary power. The unit is software controlled via CAN-Interface directly through a PC or similar controller.

2. Technical data

	EHQ 20 025p_204
Output current I_O	max. 200 µA
per channel at V_O	0 to + 2500 V
Ripple and noise	f = 10 Hz to 100 MHz: < 20 mV (at max. load) under two conditions: - at V_O > 400 V and - the **different** voltage between the channels must be less than 1400 V_O, e.g. $V_{O\ CH31}$ = 2500 V $\Rightarrow$ $V_{O\ CHn} \geq$ 1100 V; (n= 0 to 30)
Current limit I_{max}	Potentiometer (I_{max} is the same for 16 channels)
Interface	CAN-Interface
Voltage setting	via software, resolution 50 mV
Voltage measurement	via software, resolution 50 mV
Current measurement	via software, resolution 4 nA
Accuracy of voltage measurement	$\pm$ (0,01% $*$ V_O + 0,02% $*$ $V_{O\ max}$ + 1 digit) for one year
Accuracy of current measurement	$\pm$ (0,1% $*$ I_O + 0,4% $*$ $I_{O\ max}$ + 1 digit) for one year
Temperature coefficient	< 5 $*$ $10^{-5}/_K$
Stability	< 5 $*$ 10^{-5} (no load/load and Δ V_{IN})
Rate of change of output voltage via softw.	1 V/s to 125 V/s resolution 0,5 V/s 125 V/s to 250 V/s resolution 5 V/s
Channel control via software	Status 8 bit: voltage and current limit, KILL-enable, channel emergency cut-off, ramp, channel on/off, input error, current trip
16 Channels error control via software	voltage limit current limit (″16 Channels OK″ is signalled if these limits do not exceed on each.)
Error signal	Green LED at ″16 Channels OK″
Protection loop (I_s) (2 pin Lemo-socket)	5 mA < I_s < 20 mA $\Rightarrow$ module on I_s < 0,5 mA $\Rightarrow$ module off
Power requirements V_{IN}	+ 24 V (<2,4 A) and + 5 V (<0,5 A)
Packing	32-channels in 6U Euro cassette (40,64 mm wide and 220 mm deep)
Connector	96-pin connector according to DIN 41612
HV connector	51-pin Redel Multipin-Connector



3. Handling

The supply voltages and the CAN interface is connected to the module via a 96-pin connector on the rear side of the module.
The maximum output current for the channels 0 to15 and 16 to 32 are defined through the position of the corresponding potentiometer I_{max} .
It is possible to measure the hardware current limit, which has been set with reference to the maximum possible current at the socket below. 100 % I_{max} corresponds to 2,5 V. The output current will be limited to the setting value after it exceeds the threshold and the corresponding green LED on the front panel is ‘OFF‘.
At the bottom on the right side of the front panel is the socket for the safety loop. This connectors has an effect to all output voltage of all channels. If the safety loop is active then output voltage on all channels is present only if a current of any polarity is flowing in a range of 5 to 20 mA (i.e. safety loop closed). If the safety loop is opened during operation then the output voltages on all channels are shut off without ramp and the corresponding bit in the ‘Status module’ will be cancelled. After the loop will be closed again the channels must be switched ‘ON’ and a new set voltage must be given before it is able to offer an output voltage.
Additionally it is possible to install a safety loop for either channel 0 up to 15 and/or channel 16 up to 31 via the corresponding HV connector. Analogue to the above mentioned mode a current must be provided between the upper and lower SL contacts (the left and right neighbouring SL contacts are connected to each other, see the pin designation on front panel). The disconnection of a current-loop has an effect to the corresponding channel group only. In this case the SL connector should be out of operation, because this mode is of higher priority.
The pins of the loops are potential free, the internal voltage drop is ca. 3 V. Coming from the factory the safety loop is not active (the corresponding bit is always set). Removing of an internal jumper makes the loop active.
(s. App. A).

Pin assignment 96-pin connector according to DIN 41612:

PIN		PIN		PIN		Data
a1 a3 a5		b1 b3 b5		c1 c3 c5		+5V +24V GND
a11		b11		c11		@CAN_GND @CANL } potential free @CANH
a13						RESET
		b13				OFF with ramp (e.g. at power fail)
a30 a31 a32	A4 A2 A0	b30 b31 b32	A5 A3 A1	c30 c31 c32	GND GND GND	} Address field module address (A0 ... A5)

The hardware signal “OFF with ramp” (Pulse High-Low-High, pulse width ≤ 100 µs) on pin b13 will be shut off the output voltage for all channels with a ramp analogue to the Group access “Channel ON/**OFF”**. The ramp speed is defined to V_{OUTmax} / 50 s. This is the actually module ramp speed after “OFF with ramp”.
With help of the Group access “Channel **ON**/OFF**”** all channels are switched “ON” again.

With the address field a30/b30 ..... a32/b32 the module address will be coded.
(see item 4.4, description 11bit-Identifier). Connected to GND ⇒ A(n) = 0 ; contact open ⇒ A(n) = 1

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